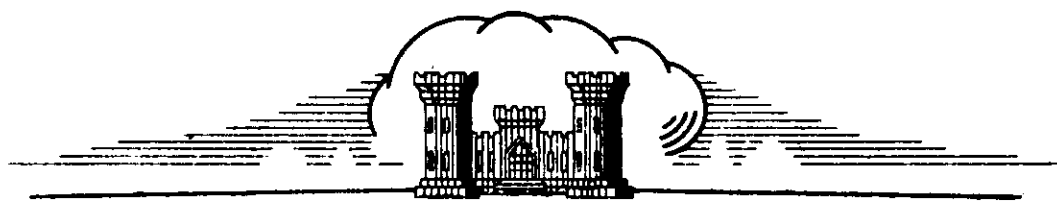


# **GREENWICH HARBOR CONNECTICUT**

## **REVIEW REPORT**

*800.921 Greenwich Station Conn.*



UNITED STATES ENGINEER OFFICE  
PROVIDENCE, RHODE ISLAND

22 JANUARY 46

Check List and Project Analysis Sheet  
for  
Survey and Review Reports

U.S. ENGINEERING DISTRICT OFFICE  
NEW HAVEN, CONNECTICUT  
JAN 24 9 36 AM '46

**Directions:** A single copy of this form will be completed and furnished with each survey or review report. Paragraphs 1 to 10 inclusive will be completed by the District Engineer, paragraphs 11 and 12 by the Division Engineer, and 13 and 14 by the Board of Engineers for Rivers and Harbors.

1. Subject of Report: Greenwich Harbor, Connecticut
2. Date of Report: January 22, 1946
3. Authority - (cite Acts or Resolutions with dates)  
Resolution - House Committee on Rivers and Harbors - Adopted April 24, 1945
4. Brief summary of existing project with date of adoption:  
Entrance channel 12 feet deep, 130 to 100 feet wide (1919 - extended 1945)  
Anchorage areas 8 feet deep and 6 feet deep (1945)  
17.5 and 5 acres respectively in area
5. Federal expenditures to date new work \$37,295.45 maintenance \$62,763.39  
(existing project) (date)  
Non-Federal expenditures to date new work none maintenance none  
(date)
6. Brief summary of improvements desired by local interests:  
Extensions to anchorage basins as follows:  
North of Grass Island, 6 feet deep at W.L.W., 12 acres  
South of Grass Island, 8 feet deep at W.L.W., 10 acres
7. Brief summary of recommendations of the district engineer:
  - a. Improvements:  
Extensions of the 6 and 8-foot anchorage basins authorized by the Act of March 2, 1945, as follows:  
6-foot anchorage, 7.5 acres  
8-foot anchorage, 4 acres
  - b. Conditions of local cooperation:
    1. Cash contribution of 60% of the cost of dredging, but not to exceed \$100,000 (\$60,000 in addition to the cash contribution required under the existing project.)
    2. Construction of public landing facilities.
    3. Release from all claims for damages resulting from the improvement.
    4. That no work be accomplished until necessary modifications of harbor lines in the vicinity shall have been effected.
  - c. Will local interests meet these conditions? Yes.
8. Accomplish and attach form entitled "Economics of Improvement Recommended."

9. Indicate by check mark in appropriate columns the activities of local representatives of other public agencies in regard to the project:

Federal or other Public Agency	: Agency interested : : and afforded op- : : portunity to ex- : : press views :	: Agencies which : : submitted writ- : : ten expressions : : of their views : : to District : : Engineer :	: Has agency pre- : : pared a separate : : report on this : : project? :
Department of the Interior:	:	:	:
Bureau of Reclamation	:	:	: no
Fish and Wildlife Service	: X	:	:
Geological Survey	:	:	:
National Park Service	:	:	:
Grazing Service	:	:	:
Office of Indian Affairs	:	:	:
Office of Land Utilization	:	:	:
Secretary	: X	:	: no
Department of Agriculture:	:	:	:
Forest Service	:	:	:
Bureau of Agricultural Economics:	:	:	:
Soil Conservation Service	:	:	:
Federal Power Commission	: X	:	: no
Federal Security Agency	:	:	:
Public Health Service	:	:	:
War Department:	:	:	:
(Local military)	:	:	:
Shore Protection Board	:	:	:
Navy Department:	:	:	:
(local) Bureau of Navigation	: X	:	: no
Coast Guard (Local)	: X	:	: no
Any other Federal Agency	:	:	:
Public Roads Administration	: X	:	: no
Drainage Basin Committee of NRFB	:	:	:
Regional Planning Commissions	:	:	:
State Planning Commissions	: X	:	: no
Conservancy Districts	:	:	:
Levee Districts	:	:	:
Drainage Districts	:	:	:
Harbor or Port Commissions (State)	: X	:	: no

10. Does the improvement recommended conflict with the plans of any other Federal or any State agency. If so with what agency and wherein is there conflict?

No.

11. Brief summary of recommendations of the Division Engineer -- (If same as District Engineer's so state)

a. Improvements: **Concur with the District Engineer**

b. Conditions of local cooperation: **Same**

12. Division Engineer to submit accomplished form "Economics of Improvements Recommended" if different from that of the District Engineer. Check one:  
Concur with District Engineer X. Separate Form submitted \_\_\_\_.

13. Brief summary of recommendations of the Board of Engineers for Rivers and Harbors - (If same as District or Division Engineer, so state)

a. Improvements:

b. Conditions of local cooperation:

14. Board of Engineers to accomplish form entitled "Economics of Improvements Recommended" (If different from that of the District or Division Engineers)

NOT FOR PUBLIC RELEASE

WAR DEPARTMENT  
UNITED STATES ENGINEER OFFICE  
PROVIDENCE, RHODE ISLAND

22 January 1946

Subject: Review report on Greenwich Harbor, Connecticut.

To: The Division Engineer, New England Division, Boston, Mass

SYLLABUS

The District Engineer finds that existing and prospective pleasure craft use of Greenwich Harbor warrants provision of additional anchorage facilities. He recommends modification of the existing project to the extent of providing an increase of about 7.5 acres and 4 acres respectively for the authorized 6 and 8-foot anchorage areas at an estimated initial cost of \$164,000 for completing all anchorage areas previously authorized and recommended herein, with \$2,100 annually for maintenance in addition to that now required, all subject to certain conditions of local cooperation.

AUTHORITY

1. This report on survey of Greenwich Harbor, Connecticut is in review of previous reports, and is submitted in compliance with Departmental direction based on the following Resolution adopted April 24, 1945 by the Committee on Rivers and Harbors of the House of Representatives:

RESOLUTION

"Resolved by the Committee on Rivers and Harbors of the House of Representatives, United States, That the Board of Engineers for Rivers and Harbors created under Section 3 of the River and Harbor Act, approved June 13, 1902, be, and is hereby, requested to review the reports on Greenwich Harbor, Connecticut, submitted in House Document Numbered 125, Seventy-sixth Congress, first Session, with a view to determining if the existing project should be modified at this time."

DESCRIPTION

2. Greenwich Harbor, Connecticut, is on the north shore of Long Island Sound near the western end. It is about 30 miles east of New York City and 4.5 miles west of Stamford Harbor, Connecticut. The outer bay, known as Captain Harbor, is partially separated from Long Island Sound by the Captain Islands, and by rocky reefs. Captain Harbor has a

RECEIVED  
JAN 24 9 37 AM '46  
ENGINEER OFFICE  
NEW ENGLAND DIV.

large area with depths of over 12 feet, lying between the Captain Islands and a line about 0.7 mile northerly therefrom. From this line the natural depths decrease gradually to less than 6 feet at the entrance of Greenwich Harbor. Greenwich Harbor is a shallow cove varying in width from 1500 feet at its entrance to 200 feet at the head of navigation, with natural depths generally less than 6 feet. The harbor extends inland about one mile from the outer bay. A dredged channel 12 feet deep and 130 feet wide extends from the outer bay into the harbor and thence 100 feet wide along the shore front nearly to the causeway at the head of the harbor. The westerly portion of the harbor, comprising the greater part of its area, is undeveloped and includes extensive mud flats bare at low tide. Grass Island lies approximately in the middle of these flats and is connected to the mainland on the west by a narrow strip of land and a short bridge. This island is the site of a sewage disposal plant and is also being developed by the Town of Greenwich for recreational purposes. The entrance to the harbor is exposed to storms from the east and southeast, but the harbor itself is well protected at all times. No bridges cross any of the navigable parts of the waterway. The harbor is tidal with practically no fresh water inflow. The mean range of tide is 7.4 feet and the spring range is 8.7 feet. The locality is shown on U. S. Coast and Geodetic Survey Charts Nos. 222 and 1213, and on Plate 1 (File No. Gh. 272) and Figures 1 and 2 (File No. Gh.273) accompanying this report.

#### TRIBUTARY AREA

3. The area tributary to Greenwich Harbor comprises the Town of Greenwich, in the extreme southwestern corner of Connecticut. It has a population of about 40,000 permanent residents. The population increase has been rapid in the past 20 years. Greenwich and its surrounding territory are residential suburbs of New York City, and have many fine estates, particularly along the shore front. The tributary area is primarily residential in character. There is some truck farming but no important manufacturing. The town has a grand list of about \$200,000,000

and a funded debt of about \$4,000,000. The rate of taxation is low. Greenwich is on the main line of the New York, New Haven and Hartford Railroad. Commuting by train to New York City is the common procedure for the many business people residing in Greenwich. Good roads prevail throughout the area. The Post Road, U. S. Route 1, passes through Greenwich, but the main highway between New York and New Haven is the Merritt Parkway which passes about 2 miles north of the center.

#### PRIOR REPORTS

4. Greenwich Harbor has been the subject of the preliminary examination and survey reports listed in the following tabulation. These reports were all favorable and form the basis of the previous and existing projects.

<u>Prior Reports on Greenwich Harbor</u>		
<u>Year</u>	<u>Improvement Recommended</u>	<u>Published In</u>
1894	9 and 6-ft. channel and 6-ft. basin	H. Ex. Doc. 25, 53d Cong., 3d sess. and Annual Report C. of E. 1895, page 860.
1909	9-ft. channel and basin	H. Doc. 309, 61st Cong., 2d session.
1913	12-ft. channel	H. Doc. 289, 63d Cong. 1st session
1938	Channel extension and anchorage basins	H. Doc. No. 125, 76th Cong., 1st session

#### EXISTING PROJECT

5. The original project, authorized in 1896 and completed in 1905, provided a channel 90 feet wide and 9 feet deep about half-way up the harbor to the steamboat wharf and thence 6 feet deep to the causeway at the head of the harbor, with a turning basin just south of the causeway. The costs prior to the adoption of the existing project were \$17,017.19 for new work and \$12,906.51 for maintenance, a total of \$29,923.70.

6. The existing project was authorized by the River and Harbor Act of March 2, 1919 and modified by the River and Harbor Act of March 2, 1945. It provides for a channel 12 feet deep at mean low water, 130

feet wide through the outer bay thence 100 feet wide to a point about 500 feet below the causeway and 100 to 140 feet wide to a point 50 feet below the causeway, for an 8-foot anchorage, about 17.5 acres east and south of Grass Island, and for a 6-foot anchorage, about 5 acres, north of Grass Island. The channel was completed in 1924 except for the 450-foot length at the head of the harbor. To complete the project requires dredging of this section and of the anchorage basins. The costs under the existing project to date have been \$37,295.45 for new work and \$62,763.39 for maintenance, a total of \$100,058.84. The existing project is about 38% completed. The estimated cost to complete the project as contained in the latest report under review is \$62,000, including \$31,000 of contributed funds. This estimate was made in 1938 and will be inadequate unless dredging costs decline from their present level. The latest (1945) approved estimate for annual cost of maintenance is \$5,350. This amount should prove adequate. No modifications of the existing project have been recommended to Congress.

#### LOCAL COOPERATION AND OTHER IMPROVEMENTS

7. The River and Harbor Act approved March 2, 1945 authorized the 6 and 8-foot anchorages and the northerly extension of the 12-foot channel subject to the conditions that local interests provide, free of cost to the United States, suitable spoil disposal areas for new work and for subsequent maintenance as required, hold and save the United States free from claims for damages resulting from the improvement, and contribute in cash or dredging at their expense 50 percent of the cost of dredging, not to exceed \$31,000. These conditions will be met. The Town has appropriated \$31,000 for this purpose. Under Federal permit the Town has dredged an area immediately east of Grass Island to a depth of 8 feet or more at mean low water. This area is within the existing project, but it has since shoaled so that the present value of the work toward the required local cooperation is small. The reported cost of this work is about \$12,000. No other works of improvement for general navigation have been accomplished by local interests.



### TERMINAL AND TRANSFER FACILITIES

8. The harbor frontage along the east side is almost a continuous wharf divided both as to ownership and usage. The total length of berthage available is about 2500 feet, over half of which is open to the public at the convenience of the owners. Mechanical handling equipment for bulk cargoes is adequate for existing needs. The Town owns two wharves which are used as landing places for pleasure craft, and also maintains a landing at the causeway for use by the municipally owned ferry. Private landing facilities for pleasure craft are maintained at the yacht club at the south end of the harbor. Adjacent to the yacht club on the north is a well equipped boat yard with three marine railways capable of handling boats up to 275 tons weight. No rail connections are available but paved highways pass at the rear of the wharves. Existing terminal facilities are adequate for present and prospective commerce. Pleasure craft facilities are inadequate. West of the channel, adjacent to Grass Island, there is no commercial development. This area will be developed by the town for recreational purposes if present plans are carried out.

### IMPROVEMENT DESIRED

9. A public hearing held at Greenwich on July 14, 1945 was well attended by State and Town officials, representatives of local clubs and local business interests. The Town desired the extension of the yacht anchorages authorized under the Act of March 2, 1945 to provide additional anchorage areas totalling 22 acres, 6 and 8 feet deep north and south respectively of Grass Island. The improvements now desired are the culmination of plans presented at the hearing held for the report under review. At that time local interests were unable to agree on the extent of improvement desired, but are now unanimously in favor of extensions of the existing anchorages to permit the development of Grass Island and the adjacent area as a yachting and recreational center. Necessary riparian rights have been purchased by the Town to permit this development. It was stated at the hearing that existing anchorage facilities are en-

tirely inadequate for even the local fleet of pleasure craft, some of which must seek anchorage in less convenient harbors. Spoil disposal areas were offered west of Grass Island and north of the causeway. In addition, it was indicated that the Town could be expected to contribute a reasonable share of the cost of the improvement.

#### COMMERCE

10. The principal items of commerce are coal, sand, gravel, and broken stone carried in box barges, and petroleum products carried in small motor tankers. The municipal ferryboats operating between Greenwich and Little Captain Island carry a small quantity of miscellaneous cargo, but are primarily for carrying passengers to and from the municipal bathing beach. The following table gives the tonnages, exclusive of ferryboat commerce, handled for the past five years.

Commerce - Greenwich Harbor, Connecticut  
Receipts and Shipments in Short Tons

<u>Commodity</u>	<u>1940</u>	<u>1941</u>	<u>1942</u>	<u>1943</u>	<u>1944</u>
Coal and coke	23,576	22,010	33,680	20,326	21,554
Petroleum products	11,653	12,642	7,418	7,066	3,681
Stone, cinders, sand and gravel	26,992	36,801	15,872	2,377	8,420
Miscellaneous	2,663	5,423	935	-	36
Totals	64,884	76,876	57,905	29,769	33,691
Passengers	-	165,102	129,512	91,240	98,986

For ten years prior to the war commerce averaged about 90,000 tons annually. The decrease in tonnage since 1941 was caused by decreased shipping activity due to war conditions. It is expected that commerce will increase sharply when normal transportation conditions are restored.

11. In prewar years the boat yard provided winter storage for about 100 boats annually and serviced several times this number. Gross income to the community from yachting has been estimated to total between \$800,000 and \$1,000,000 annually. With additional anchorage facilities and return of normal business conditions a material increase in this amount is practically assured.

### VESSEL TRAFFIC

12. Traffic by vessels carrying commodities, including ferry movements, is given in the following table for the calendar years 1942 to 1944.

<u>Vessel Statistics - Greenwich Harbor, Conn.</u>			
<u>Type and Loaded Draft in Feet</u>	<u>1942</u>	<u>Inbound or Outbound</u>	
		<u>1943</u>	<u>1944</u>
Motor vessels:			
10 to 12 feet	1	1	1
Under 8 feet	1155	837	753
Sailing vessels:			
Under 8 feet	-	3	-
Barges:			
12 to 14 feet	-	-	6
10 to 12 feet	77	34	32
8 to 10 feet	-	-	2
TOTALS	1233	875	794

13. The local pleasure craft fleet consists of over 300 craft both motor and sail ranging from 16 to 270 feet in length and 2 to 12 feet in draft and valued at over \$3,000,000. During the summer season visiting craft outnumber local craft. No record is available to indicate the number of trips of these vessels, but traffic is heavy during the summer season.

### DIFFICULTIES ATTENDING NAVIGATION

14. Protected anchorage area is inadequate. Local and visiting craft anchor near the commercial channel and are liable to damage from commercial traffic. Insufficient relief from the congested situation in the harbor will be experienced when the existing project is completed. The approved channel is adequate to meet the needs of commerce and no difficulties are expected to be experienced after the northerly extension of the channel is completed.

### SURVEY

15. Examination of the harbor made in 1938 included hydrography and topography of the entire inner harbor and the outer channel. For the

purpose of this report a survey of the area adjacent to Grass Island as well as of the proposed spoil areas has been made. Maps accompanying this report are based on the 1938 survey and the latest additional information and are as follows:

Plate 1      File No. Gh. 272

Figure 1     File No. Gh. 273, Sheet 1

Figure 2     File No. Gh. 273, Sheet 2

#### PLAN OF IMPROVEMENT

16. An estimate has been prepared for the plan of improvement desired by local interests. It consists of an anchorage 6 feet deep at mean low water, 12 acres in extent, north of Grass Island and an anchorage basin 8 feet deep, 10 acres in area, south of Grass Island. Estimates have also been prepared for an alternate plan consisting of anchorage basins 6 and 8 feet deep at mean low water, 7.5 and 4 acres in area, north and south respectively of Grass Island. The areas specified above are in addition to the 6 and 8-foot anchorages authorized by the River and Harbor Act approved March 2, 1945 amounting to 5 and 17.5 acres respectively. Estimates for both plans include dredging of the anchorage areas already authorized but not dredged. The costs shown herein are thus not wholly in addition to the estimated costs of work authorized by the River and Harbor Act approved March 2, 1945. The unit price used is higher than that previously used for the existing 6 and 8-foot anchorage project, due to prospective higher dredging costs.

17. Greenwich is extensively developed for residential purposes so that spoil disposal areas sufficient for the entire work are not located within economical pumping distance. The cost of disposing of dredged material in deep water is estimated to be about equal to hydraulic disposal under these circumstances. Dredging estimates are based on disposal in deep water and include 1 foot allowable overdepth dredging. The unit prices include costs of engineering and administration.

I. Estimated cost of desired improvement

a. 6-foot anchorage area.

Anchorage area 6 feet deep at mean low water, lying north of Grass Island, about 17 acres (including 5 acres authorized but not dredged).

Dredging 260,000 cubic yards  
mud and sand at 40 cents .....\$104,000

Estimated annual cost of maintenance.....\$ 2,700

b. 8-foot anchorage area

Anchorage area 8 feet deep at mean low water, lying east and south of Grass Island, about 27.5 acres (including 17.5 acres authorized but not dredged).

Dredging 385,000 cubic yards  
mud and sand at 40 cents.....\$154,000

Estimated annual cost of maintenance..... 4,000

II. Estimated cost of alternate improvement

a. 6-foot anchorage area

Anchorage area, 6 feet deep at mean low water, lying east and north of Grass Island, about 12.5 acres (including 5 acres, authorized but not dredged).

Dredging 180,000 cubic yards  
mud and sand at 40 cents.....\$ 72,000

Estimated annual cost of maintenance.....\$ 2,000

b. 8-foot anchorage area

Anchorage area 8 feet deep at mean low water, lying east and south of Grass Island, about 21.5 acres (including 17.5 acres authorized but not dredged)

Dredging 230,000 cubic yards  
mud and sand at 40 cents.....\$ 92,000

Estimated annual cost of maintenance..... 3,000

18. Additional expenditures will be made by the Town of Greenwich in improvement of the area adjacent to the proposed yacht basins. Public landing facilities will be established in conjunction with public boat-houses. Parking areas and space for open winter storage of boats will be provided. Extensive bulkheading and filling will be accomplished by the

Town. Although a portion of this work will be of benefit to general pleasure craft navigation, the greater portion of the development work is for park purposes and general beautification of the harbor. The estimated total cost of this work is not known, but it is assumed that the cost of landing facilities, boathouses and storage areas will be liquidated by nominal charges for their use, therefore no portion of the cost of the foregoing development by the Town is considered as local cooperation.

#### AIDS TO NAVIGATION

19. The Coast Guard has been consulted and has concurred in the opinion that the plan under consideration will require no additional navigation aids.

#### ANALYSIS OF ECONOMIC JUSTIFICATION

20. The total annual charges have been computed for the desired and alternate plans of improvement, which include the areas authorized by the River and Harbor Act approved March 2, 1945. Interest and amortization were figured using an interest rate of 3 percent on Federal investment, and 3-1/2 percent on non-Federal funds. A useful life of 25 years has been assumed for all improvements. Local contribution totalling about 60% of the cost of the improvements has been assumed. Expenditures required and annual charges are summarized in the following tabulation:

<u>Summary of Estimated Costs</u>				
<u>Item</u>	<u>Federal</u>	<u>Non-Federal</u>	<u>Total</u>	<u>Maintenance</u>
<u>Desired Improvement</u>				
Dredging 6-foot basin	\$ 41,600	\$ 62,400	\$104,000	\$ 2,700
Dredging 8-foot basin	<u>61,600</u>	<u>92,400</u>	<u>154,000</u>	<u>4,000</u>
Total	103,200	154,800	258,000	6,700
<u>Alternate Improvement</u>				
Dredging 6-foot basin	\$ 28,800	\$ 43,200	\$ 72,000	\$ 2,000
Dredging 8-foot basin	<u>36,800</u>	<u>55,200</u>	<u>92,000</u>	<u>3,000</u>
Total	65,600	98,400	164,000	5,000

Estimated Annual Carrying Charges

	<u>Federal</u>		<u>Non-Federal</u>	
<u>Item</u>	<u>Interest and Amortization</u>	<u>Maintenance</u>	<u>Interest and Amortization</u>	<u>Total</u>
	<u>Desired Improvement</u>			
6 and 8-foot basins	\$ 5,900	\$ 6,700	\$ 9,400	\$22,000
	<u>Alternate Improvement</u>			
6 and 8-foot basins	\$ 3,800	\$ 5,000	\$ 6,000	\$14,800

WATER POWER AND OTHER SPECIAL SUBJECTS

21. Questions of water power and flood control are not pertinent to this report. Prospective use of the harbor as a seaplane base would not be adversely affected by the proposed improvements. The improvements considered will not have an adverse effect on wild life nor result in erosion or accretion on the shores adjacent to the harbor. Disposal of dredged material hydraulically, or deposit of dry fill by the Town of Greenwich if hydraulic disposal proves uneconomical, will result in the reclamation of some marsh land. The approaches to the harbor are used for the cultivation of oysters, but the areas so used are too far from the area under consideration to be affected by the improvement thereof.

DISCUSSION

22. Greenwich Harbor is favorably situated to serve the extensive pleasure boat activity in western Long Island Sound. Its outer harbor, Captain Harbor, is a favorite cruising course during the summer season. Greenwich and the towns adjacent to it are largely residential. A large part of the population is composed of New York businessmen who maintain homes in Connecticut solely because of the attractions of the area. Despite its residential character, Greenwich has few facilities for recreational boating. Its harbor has a large area, removed from the commercial channel, suitable for development as a pleasure craft anchorage and base. The Town of Greenwich has contemplated the improvement of this area for

over 20 years, but no definite plans had been formulated until recently. The existing pleasure craft anchorages authorized by the River and Harbor Act approved March 2, 1945 resulted from plans presented in 1938. At that time it was contemplated that eventual extension of these areas would be desirable and necessary. Town officials now desire that these authorized areas be enlarged in order that existing pleasure boats can be accommodated and to provide room for the anticipated increased use of this harbor by visiting craft.

23. In 1937, a survey was made by this office to determine the relative use of various harbors in the State of Connecticut. At that time there were in excess of 500 pleasure craft, exclusive of rowboats, owned in the Town of Greenwich and based in Greenwich Harbor, Greenwich Cove and Coscob Harbor. During the summer season an additional 460 craft, owned by summer residents, sought to base in waters adjacent to the town. At that time there were insufficient protected anchorage areas available to accommodate these boats. As a result, over 50 percent were required to moor in locations unsuited to their needs. No additional anchorage areas have been provided in the locality since 1937 although construction of yacht basins in Greenwich Harbor was authorized in 1945.

24. The anchorage areas requested by local interests are too extensive and the cost per acre too high to warrant favorable recommendation. Smaller areas, as considered in the alternate plan, can be constructed at a more reasonable cost and will provide for a considerable increase in the number of boats using the harbor. When Greenwich needs additional anchorage area, it can be provided at lower cost in adjacent harbors within the Town. Local interests are satisfied that the alternate plan will meet their requirements for yachting in Greenwich Harbor.

25. It has been estimated by yachting interests that about one-quarter of the pleasure craft owned in this country are based in and around the western end of Long Island Sound. There are numerous small harbors in this vicinity, all crowded with their own local fleets. Only minor fa-



cilities are available to accommodate an increase in the size of this fleet. Facilities that were constructed prior to 1940 were immediately used to capacity. Under the proposed plan of improvement there would be provided sheltered anchorage areas lying in the heart of the business section of Greenwich, adjacent to excellent rail and highway facilities. Under these circumstances, transient craft would be particularly attracted to the area.

26. The monetary benefits, both general and local, to be derived from the increase in anchorage facilities and development of shore facilities in Greenwich Harbor are not susceptible to accurate evaluation. In view of the large local fleet, local benefits are considered greater than the benefits that would accrue to the general public. Although Greenwich Harbor in the past has been used equally as much by transient craft as by the local fleet it is considered that the development of additional facilities will stimulate an increase in the local fleet and thus increase the percentage of use by locally owned boats. In a previous paragraph it was stated that pleasure craft now expend about \$800,000 annually in Greenwich. An increase of only 20 percent in this amount would provide local benefits in excess of the annual charges for all pleasure craft facilities presently authorized or under consideration for the locality. Such an increase is practically assured. The net benefits from such an increase would amount to about \$16,000 annually. The alternate plan of improvement with annual charges of \$14,800 is therefore justified.

27. General benefits from the improvement will accrue through use of the harbor for refuge and stimulation of the entire boating industry. These general benefits warrant Federal participation. The extensive local benefits to be obtained are considered to be greater than the general benefits. A local contribution of about 60 percent of the cost of dredging should be required. Such a measure of local cooperation would require a cash contribution of \$98,400 or \$67,400 in addition to that required under the existing project. Such cooperation is reasonably assured. In addition,

local interests should be required to furnish suitable public landing facilities with fuel and water services for use by pleasure craft. Local interests state that these facilities will be provided. Since these facilities will probably be self-liquidating, no portion of their cost should be accepted as meeting the cooperation specified above.

28. The spoil disposal areas offered by local interests are insufficient for the entire quantity of dredging to be accomplished. No other suitable areas are available within economical pumping distance. The local cash contribution specified above is considered adequate to cover the minor increased cost of dredging due to this condition. The additional cost of dredging a portion of the project with a hydraulic dredge, in order to provide 150,000 to 200,000 cubic yards of fill if desired by local interests for land reclamation, would be of minor importance. No additional cash contribution is deemed necessary in this event.

29. In addition to the foregoing measures of local cooperation, revision of the existing harbor lines in the areas north and south of Grass Island is necessary in order that the maneuvering and anchorage capacity of the basins will not be encroached upon by permanent structures.

#### CONCLUSIONS

30. Present and prospective pleasure boat use of Greenwich Harbor warrants extension of the anchorage facilities authorized but not dredged. The alternate plan of improvement is considered adequate for existing and immediately prospective needs. Any further additions to anchorage facilities should be located elsewhere when their provision becomes necessary. Local interests are satisfied that the alternate plan will meet their requirements for Greenwich Harbor.

31. The proposed improvement will provide protected refuge facilities for small craft, and will be accompanied by general as well as local benefits. General benefits are sufficient to warrant Federal participation to the extent of about 40 percent of the cost of dredging. Suitable public landing facilities are an essential part of the project and should be

provided by local interests in addition to a cash contribution of 60 percent of the cost of dredging. Local cooperation to this extent is reasonably assured.

#### RECOMMENDATIONS

32. Modification of the existing project for Greenwich Harbor is recommended to the extent of providing, in addition to the anchorage areas authorized by the River and Harbor Act approved March 2, 1945, extensions of about 7.5 acres to the 6-foot anchorage area north of Grass Island and of about 4 acres to the 8-foot anchorage area south of Grass Island, generally as shown on the accompanying map, at an estimated cost for completing all anchorage areas previously authorized and recommended herein of \$164,000 (\$105,600 in addition to the estimated cost of the anchorages authorized by the River and Harbor Act approved March 2, 1945, of which \$27,000 is for prospectively higher costs on the existing project) with \$2,100 annually for maintenance in addition to that required for all presently authorized improvements, subject to the following conditions:

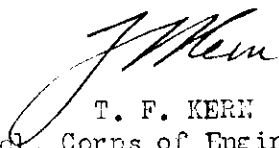
(a) That local interests contribute in cash 60 percent of the cost of dredging, but not to exceed \$100,000 (\$69,000 in addition to the contribution required by the River and Harbor Act approved March 2, 1945).

(b) That local interests construct concurrently for local and transient craft public landing facilities of a design satisfactory to the Chief of Engineers.

(c) That local interests hold and save the United States free from claims for damages resulting from the improvement.

(d) That the work shall not be undertaken until necessary modifications of the harbor lines in the vicinity shall have been effected.

33. If the project is authorized, funds in the amount of \$65,600 for the Federal portion of the initial cost should be allotted in one sum to secure economical prosecution of the work.

  
T. F. KERN  
Colonel, Corps of Engineers  
District Engineer

5 Inclosures:

Plate 1, File No. Gh. 272  
Figure 1, File No. Gh. 273, Sheet 1  
Figure 2, File No. Gh. 273, Sheet 2  
Record of Hearing, in triplicate  
Check Sheet and Project Analysis Sheet,  
in triplicate.  
(Under separate cover - tracings of Gh.  
272 and Gh. 273, Sheets 1 and 2).

SUBJECT: Review Report on Greenwich Harbor, Connecticut

NEDGW  
(22 Jan 46)

1st Ind.

CAT/mms

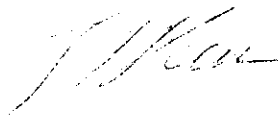
Division Engineer, New England Division, Boston 10, Mass., 29 January 1946

TO: The Chief of Engineers, U. S. Army, Washington 25, D. C.  
ATTENTION: SPEWR

1. The existing project for Greenwich Harbor, Connecticut, includes an 8-foot anchorage of about 17.5 acres, situated east and south of Grass Island, and a 6-foot anchorage of about 5 acres, situated north of Grass Island. No work has been done on the construction of either anchorage.

2. Local interests request a modification of the existing project to provide an 8-foot anchorage of about 27.5 acres, east and south of Grass Island and a 6-foot anchorage of about 17 acres, north of Grass Island. These anchorage areas requested are considered more extensive than the traffic requires and their cost is too high to warrant favorable consideration at this time. However, the District Engineer finds that present and prospective pleasure boating in this harbor warrants increasing the 6-foot anchorage to 12.5 acres and the 8-foot anchorage to 21.5 acres.

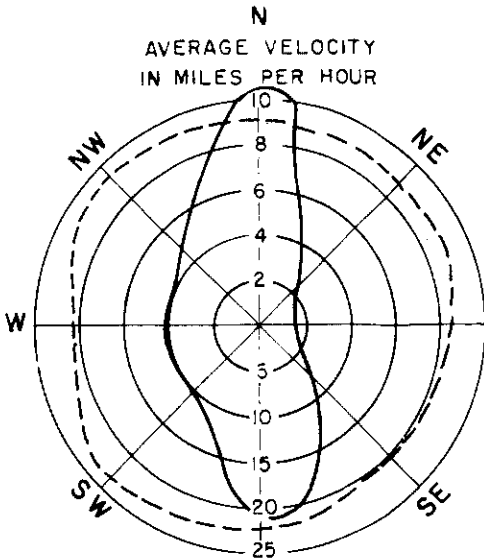
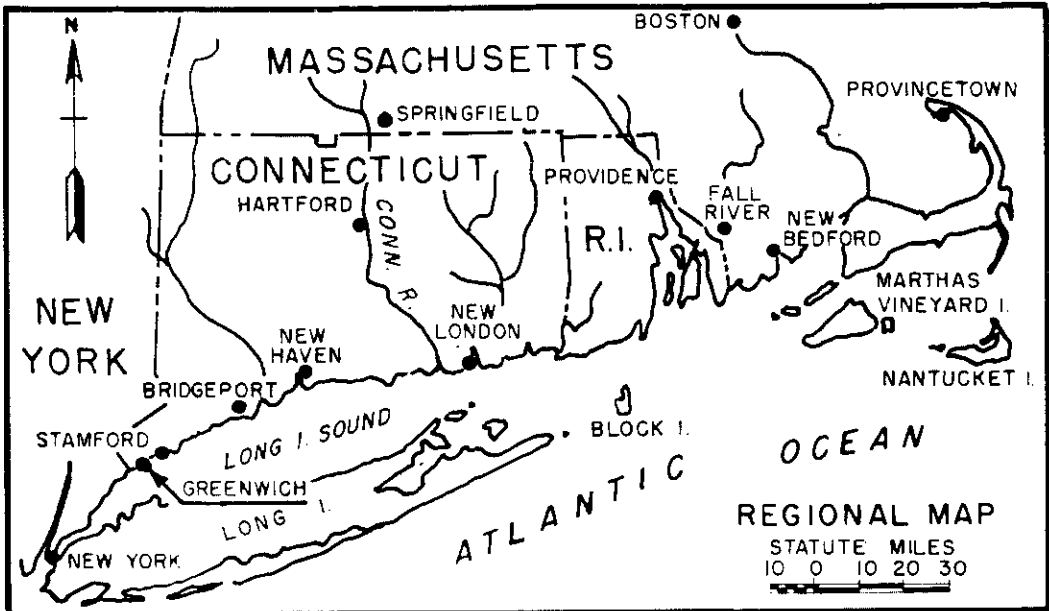
3. I concur in the recommendation of the District Engineer.



T. F. KERN  
Colonel, Corps of Engineers  
Acting Division Engineer

5 Inclosures:

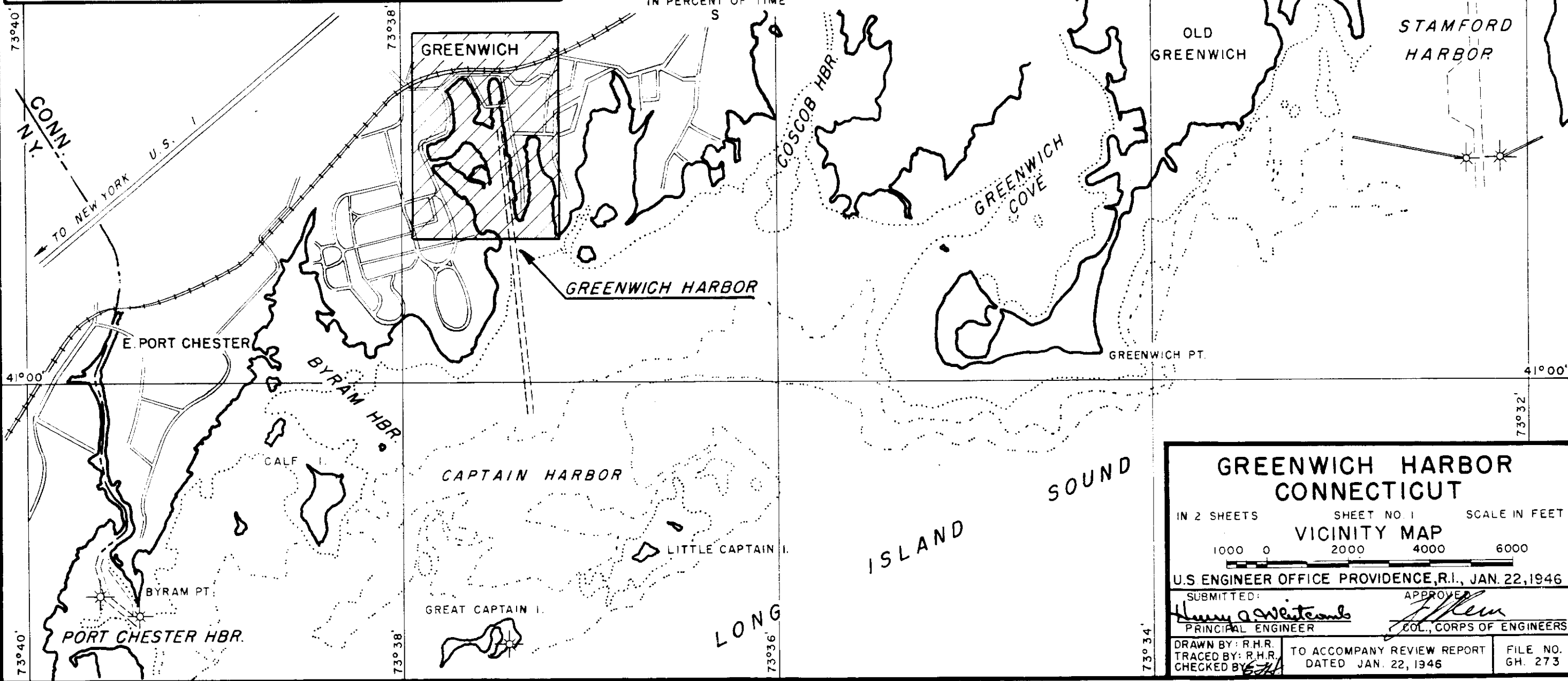
Plate 1, File No. Gh. 272  
Figure 1, File No. Gh. 273, Sheet 1  
Figure 2, File No. Gh. 273, Sheet 2  
Record of Hearing, in duplicate  
Check Sheet and Project Analysis Sheet,  
in duplicate  
(Under separate cover - tracings of Gh.  
272 and Gh. 273, Sheets 1 and 2)



WIND DIAGRAM FOR NEW HAVEN CONN.

LEGEND  
--- AVERAGE VELOCITY IN M.P.H.  
--- DURATION IN PERCENT OF TIME

N.Y.N.H.&H.R.R.  
TO NEW YORK



### GREENWICH HARBOR CONNECTICUT

IN 2 SHEETS      SHEET NO. 1      SCALE IN FEET

VICINITY MAP

1000 0 2000 4000 6000

U.S. ENGINEER OFFICE PROVIDENCE, R.I., JAN. 22, 1946

SUBMITTED:	APPROVED:
<i>Henry G. Whitecomb</i>	<i>[Signature]</i>
PRINCIPAL ENGINEER	COL., CORPS OF ENGINEERS

DRAWN BY: R.H.R.	TO ACCOMPANY REVIEW REPORT	FILE NO.
TRACED BY: R.H.R.	DATED JAN. 22, 1946	GH. 273
CHECKED BY: <i>[Signature]</i>		

FIGURE 1

← TO NEW YORK  
N. Y. N. H. & H. R. R.

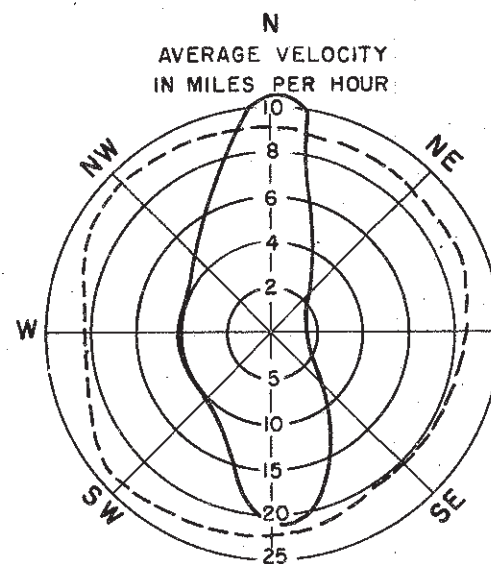
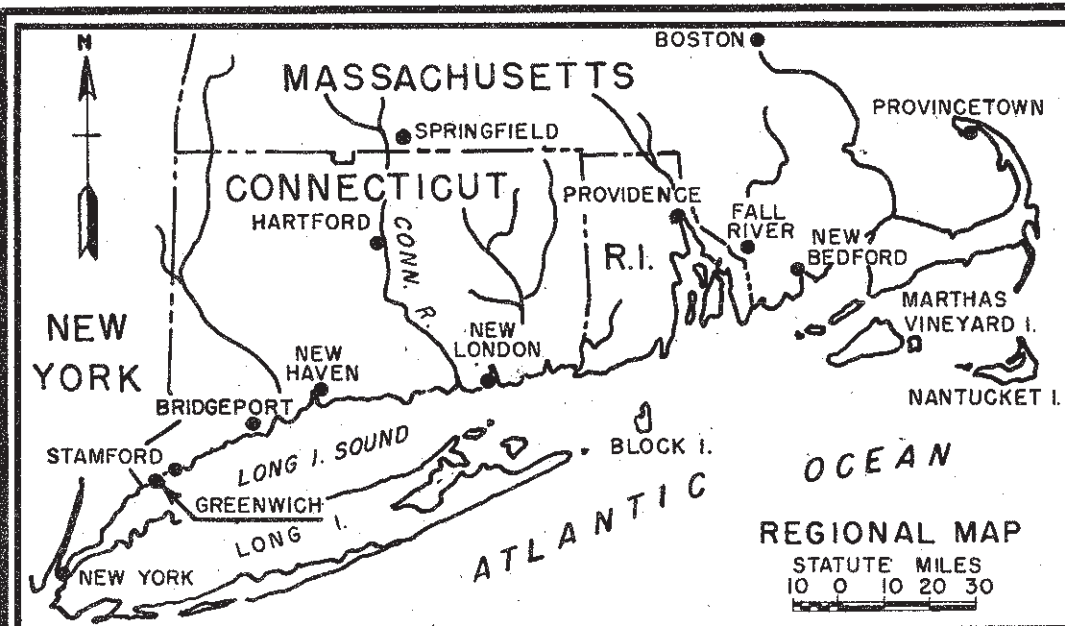


Recommended improvements shown thus: ☐

DRAWN BY: R.H.R. TRACED BY: R.H.R. CHECKED BY: <i>6-91</i>	TO ACCOMPANY REVIEW REPORT DATED JAN. 22, 1946	FILE NO. GH. 273
--	---	---------------------

FIGURE 2



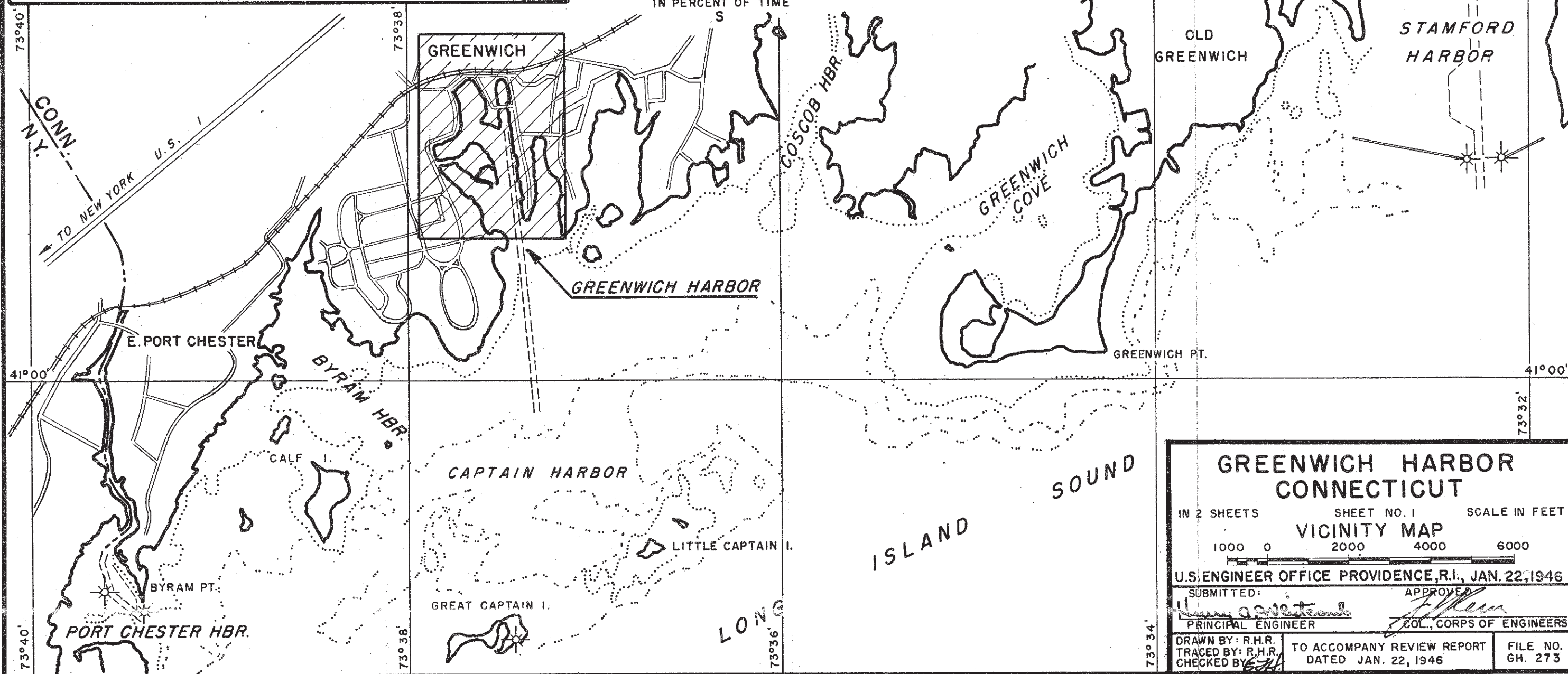


WIND DIAGRAM FOR NEW HAVEN CONN.

LEGEND

--- AVERAGE VELOCITY IN M.P.H.  
— DURATION IN PERCENT OF TIME

N. Y. N. H. & H. R. R.  
TO NEW YORK



<b>GREENWICH HARBOR CONNECTICUT</b>		
IN 2 SHEETS	SHEET NO. 1	SCALE IN FEET
1000 0 2000 4000 6000		
U.S. ENGINEER OFFICE PROVIDENCE, R.I., JAN. 22, 1946		
SUBMITTED:	APPROVED:	
<i>[Signature]</i>	<i>[Signature]</i>	
PRINCIPAL ENGINEER	COL., CORPS OF ENGINEERS	
DRAWN BY: R.H.R.	TO ACCOMPANY REVIEW REPORT	FILE NO.
TRACED BY: R.H.R.	DATED JAN. 22, 1946	GH. 273
CHECKED BY: <i>[Signature]</i>		